

SEVEN NEW SPECIES OF *POLYPLECTROPUS* ULMER
(TRICHOPTERA: POLYCENTROPODIDAE) FROM COSTA RICA

MARIA LOURDES CHAMORRO-LACAYO AND RALPH W. HOLZENTHAL

Department of Entomology, University of Minnesota, 1980 Folwell Ave., Room 219
Hodson Hall, Saint Paul, MN 55108, U.S.A. (e-mail: cham0138@umn.edu)

Abstract.—Seven new species of *Polyplectropus* collected during an inventory of the Trichoptera of Costa Rica are described and illustrated: *Polyplectropus clauseni*, *Polyplectropus exilis*, *Polyplectropus hymenochilus*, *Polyplectropus kylistos*, *Polyplectropus paradelpheae*, *Polyplectropus perpendicularis*, and *Polyplectropus yolandae*.

Key Words: Trichoptera, *Polyplectropus*, Polycentropodidae, Costa Rica, new species, taxonomy, systematics, Neotropics, biodiversity

The genus *Polyplectropus* Ulmer 1905 is distributed worldwide, with representatives in Africa, the Orient, New Zealand, and tropical America (Morse 2001). The defining adult character for the genus is the absence of R2 (Fork I) in the hind wings. However, apparent differences in genitalia and larval characters between Old and New World species of *Polyplectropus*, leave uncertainties regarding the monophyly of *Polyplectropus* (Flint et al. 1999). The senior author will be addressing this issue in the future.

Notwithstanding, the genus *Polyplectropus* presently has 138 species (Morse 2001), 93 in the Old World and 45 in the New World, mainly in the Neotropics (Flint et al. 1999). Earlier authors, including Ross (1941, 1947), Denning (1962), and Yamamoto (1966, 1967), described several New World species under the genus *Polycentropus* Curtis 1835, which were later transferred to *Polyplectropus* by Flint (1968). Flint further synonymized the genera *Ecnomodellina* Ulmer 1962 (= *Ecnomodes* Ulmer 1911) (Flint 1968) and *Cordillopsyche* Banks 1913 (Flint 1967) with *Polyplectropus*. Bueno-Soria (1990) described

16 new species and revised the Mexican and Central American *Polyplectropus* species and found these to be monophyletic.

Earlier and ongoing Trichoptera inventories in Costa Rica, Nicaragua, Venezuela, and Brazil by the authors and their colleagues have yielded numerous additional new *Polyplectropus* species. Seven of these new species, all from Costa Rica, are described below. Previously, eight species of *Polyplectropus* were recorded from Costa Rica (Flint et al. 1999).

Types are deposited in the University of Minnesota, Saint Paul, Minnesota (UMSP), the National Museum of Natural History, Smithsonian Institution, Washington, D.C. (NMNH), and the Instituto Nacional de Biodiversidad, Heredia, Costa Rica (IN-BIO). The terminology used in this paper has been adapted from Hamilton (1986).

***Polyplectropus clauseni* Chamorro-L.
and Holzenthal, new species**
(Fig. 1)

Polyplectropus clauseni is a member of the *thilus* group of Yamamoto (1967) based on its similarities to *Polyplectropus deltoides* (Yamamoto) 1967, especially the shape

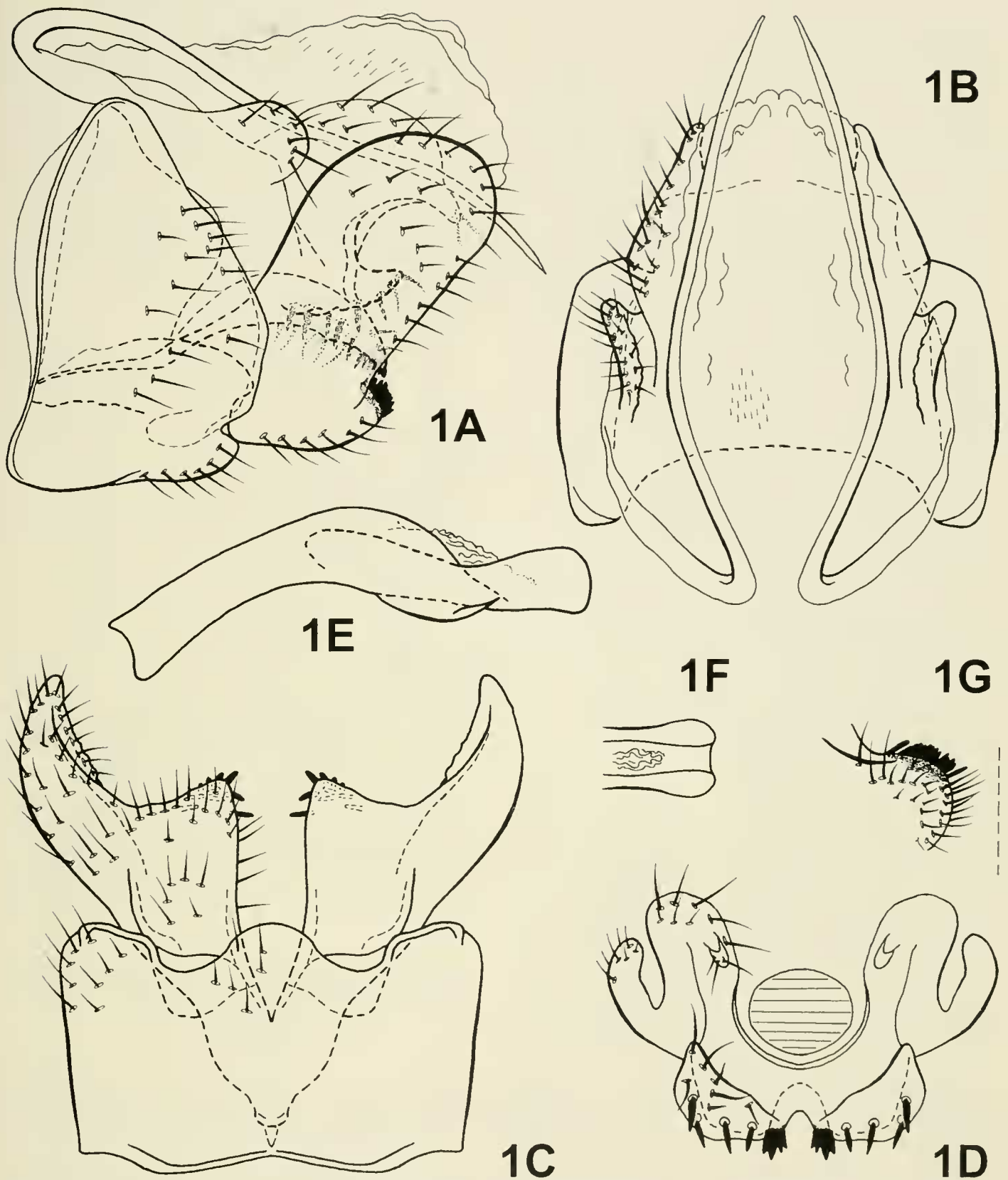


Fig. 1. *Polyplectropus clauseni*, male genitalia. A, Lateral view. B, Dorsal view. C, Ventral view. D, Caudal view of preanal appendage. E, Phallus. F, Apex of phallus, dorsal view. G, Ventromesal lobe of inferior appendage, caudal view.

of the intermediate appendage, the dorso-lateral and the mesolateral processes of the preanal appendage, and the dorsolateral and ventromesal lobes of the inferior appendage. *Polyplectropus clauseni* can be distinguished from *P. deltoides* by the shape of

the ventromesal process of the preanal appendage, which in lateral view appears bipartite, with the dorsal lobe directed dorsally and the ventral lobe directed ventrally, both similar in size and shape and bearing robust, sclerotized spines. It is also distin-

guished by the presence of median ventrolateral spines on the phallus.

Male.—Length of forewing 5.1 mm. Color of body and antennal scape yellowish brown; dorsum of head, pronotum, anterior half of mesothorax, tegula, and forewing base with long, erect brown and white setae; forewing with patches of brown, white, and golden setae, anterior edge bearing only patches of thick brown setae. Genitalia as in Fig. 1. Sternum IX, in lateral view with ventral margin nearly straight, posterior margin dorsally narrow, expanded medially, and becoming notched subventrally, anterior margin sinuate; in ventral view rectangular, posterior margin with median hump flanked by lateral indentations. Tergum X membranous, broad, elongate, bearing dorsal microsetae. Intermediate appendage setose, in lateral view semicircular, expanding posteroventrally into lobe bearing apical setae; in dorsal view elongate, narrow, slightly expanded basomesally. Preanal appendage apparently tripartite; dorsolateral process, heavily sclerotized, elongate, originating from dorsum of mesolateral process, directed anteromesally, recurved posterolaterally, tapering mesally to acute apex; mesolateral process setose, in dorsal view digitate, apex rounded and directed laterally, in lateral view circular, apparently expanded into ventromesal process; ventromesal process, in lateral view appearing bipartite, with dorsal lobe directed dorsally and ventral lobe directed ventrally, both lobes similar in size and shape and bearing robust, sclerotized spines and pointed apices; in caudal view trapezoidal, with mesoventral corner bearing cluster of robust, sclerotized spines, ventrolateral margin rounded with additional robust, sclerotized spines along venter. Inferior appendage divided into two lobes; dorsolateral lobe setose, in lateral view oval, broad, with posterodorsal margin rounded, in ventral view with lateral margin rounded, produced into narrow apex, mesal margin narrow, expanding into ventromesal lobe; ventromesal lobe short, setose, bearing cluster

of robust, sclerotized spines, in lateral view with ventral margin nearly straight, posterior margin truncate, lobe barely exceeding origin of posterior margin of dorsolateral lobe, in ventral view triangular, mesal margin straight, with semicircular ventromesal hump arising from base of inferior appendage. Phallobase short, narrow, with apicoventral spines; phallic sclerite cylindrical with apex truncate, apex in dorsal view with median trough.

Female.—Unknown.

Type material.—Holotype, ♂: COSTA RICA: Alajuela: Cerro Campana, Río Bochinche, tributary, 6 km (air) NW Dos Ríos, 10.945°N, 85.413°W, el. 600 m, 22–23.vii.1987, Holzenthal, Morse, Clausen (UMSP) (UMSP000060983). Paratypes: Guanacaste: Parque Nacional Rincón de la Vieja, Quebrada Agua Apinolada, 10.759°N, 86.292°W, el. 795 m, 25.vi.1996, Holzenthal, Heyn, Armitage, 1 ♂ (UMSP); Guanacaste: Río Los Ahogados, 11.3 km, ENE Quebrada Grande, 10.865°N, 85.423°W, el. 470 m, 7.iii.1986, Holzenthal & Fash, 1 ♂ (NMNH).

Etymology.—Named in honor of Dr. Philip Clausen, Curator, University of Minnesota Insect Collection, in recognition of his many years of service in caring for the collection.

***Polyplectropus exilis* Chamorro-L. and
Holzenthal, new species**
(Fig. 2)

Polyplectropus exilis is a member of the *charlesi* group, as defined by Bueno-Soria (1990), and appears to be most closely related to *Polyplectropus beutelspacheri* Bueno-Soria 1990, based on similarities in the shape of the preanal appendage and in the overall shape of the inferior appendage. *Polyplectropus exilis* differs from *P. beutelspacheri* in the posteroventrally extended margin of the inferior appendage when viewed laterally, in the shorter and narrower ventromesal lobe of the inferior appendage, which is devoid of robust sclerotized apical spines, in the presence of a long, nar-

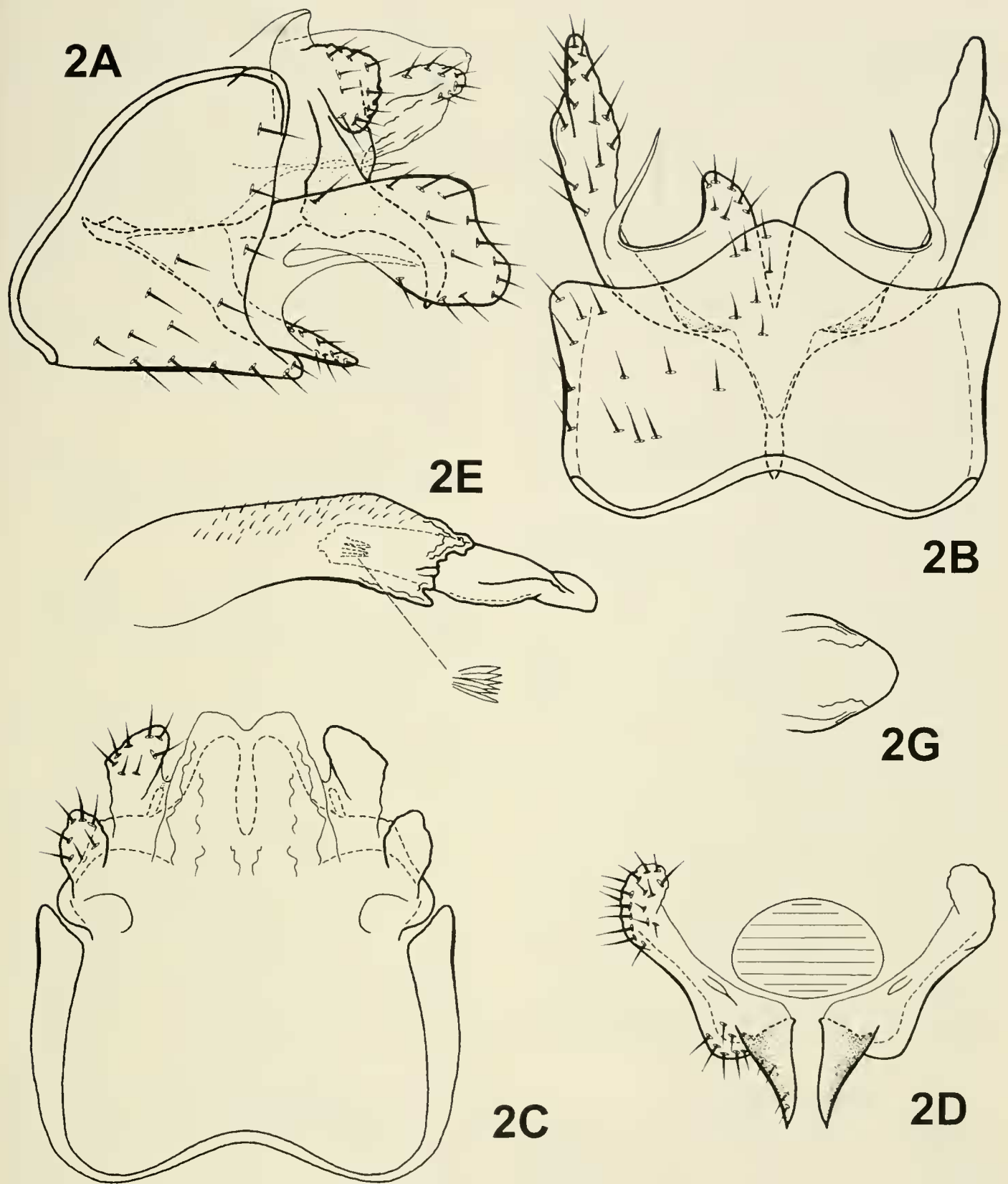


Fig. 2. *Polyplectropus exilis*, male genitalia. A, Lateral view. B, Ventral view. C, Dorsal view. D, Caudal view of preanal and intermediate appendages. E, Phallus and phallic spines. G, Apex of phallus, dorsal view.

row, transparent, posteriorly directed projection originating equidistantly from both lobes of the inferior appendage, and in the mesoventrally expanded sternum IX.

Male.—Length of forewing 5.0–5.9 mm. Color of body yellowish brown, legs with

long, yellowish-brown setae on femora and tarsi; dorsum of head, pronotum, and tegula with long, erect brown setae, apex of head with cluster of whitish, stout setae; forewing covered by brown setae and scattered patches of golden setae. Genitalia as in Fig.

2. Sternum IX, in lateral view with ventral margin straight, expanded posteriorly, posterior margin nearly straight, curving ventrally, ventral margin slightly produced anteriorly; in ventral view, nearly rectangular, posterior margin produced mesoventrally. Tergum X membranous, short. Intermediate appendage digitate, setose, not exceeding tergum X, produced posteromesally in dorsal view. Preanal appendage bipartite; mesolateral process deltoid, setose, produced into mesoventral process with small papillate lobe originating midway between both processes; mesoventral process basally broad, curving posteroventrally into acute apex. Inferior appendage divided into two lobes and medial process; dorsolateral lobe, in lateral view, club-shaped, setose, expanded posteroventrally, in ventral view elongate and narrow; ventromesal lobe setose, short, one third size of dorsolateral lobe, in lateral view narrow, tapering into rounded apex, in ventral view deltoid, directed posterolaterally; medial process arising equidistant from both lobes, lightly sclerotized, tapering into acute apex, directed posteromesally, longer than ventromesal lobe (medial process broken in some paratypes). Phallobase long, apically membranous; phallic sclerite cylindrical, sclerotized, narrowing into rounded apex, constricted subapically; phallic apparatus with approximately six small phallic spines, unclear if embedded in phallic sclerite or endothecal membrane.

Female.—Unknown.

Type material.—Holotype: ♂. COSTA RICA: Cartago: Reserva Tapanti, Quebrada Segunda at administration building, 9.761°N, 83.787°W, el. 1,250 m, 9–10.v.1990, Holzenthal and Blahnik (UMSP) (UMSP000060974). Paratypes: Alajuela: Reserva Forestal San Ramón, Río San Lorenzo and tributaries, 10.216°N, 84.607°W, el. 980 m, 30.iii–1.iv.1987, Holzenthal, Hamilton, Heyn, 2 ♂ (UMSP); Puntarenas: Río Guineal, ca. 1 km (air), E. Finca Helechales, 9.076°N, 83.092°W, el. 840 m, 4.viii.1987, Holzenthal, Morse, Clausen, 3

♂ (INBIO); same data as previous, 22.ii.1986, Holzenthal, Morse, Fasth, 4 ♂ (NMNH); Puntarenas: Río Cotón in Las Alturas, 8.938°N, 83.826°W, el. 1,360 m, 18.iii.1991, Holzenthal, Muñoz, Huisman, 1 ♂ (UMSP); Puntarenas: Río Singrú, ca. 2 km (air) S. Finca Helechales, 9.057°N, 83.082°W, el. 720 m, 21.ii.1986, Holzenthal, Morse, Fasth, 6 ♂ (UMSP).

Etymology.—*Exilis* is the Latin word for weak or thin, which describes the lightly sclerotized medial processes arising from both lobes of the inferior appendages of the genitalia.

***Polyplectropus hymenochilus* Chamorro-L. and Holzenthal, new species**

(Fig. 3)

Polyplectropus hymenochilus belongs to the *charlesi* group, based on similarities with *Polyplectropus mignona* Bueno-Soria 1990, especially the shape of the ventromesal lobe of the inferior appendage and the mesolateral and mesoventral processes of the preanal appendage. However, *P. hymenochilus* can be easily distinguished from *P. mignona* and other members of this group by the presence of a recurved dorsolateral process on the preanal appendage, by the membranous posteroventral extension of the intermediate appendage, which surrounds the phallus, and by the rod-like dorsolateral lobe of the inferior appendages, bearing a single apical spine.

Male.—Length of forewing 4.5–4.7 mm. Color of body brown, antenna and legs yellowish brown; dorsum of head, pronotum, anterior half of mesothorax, and tegula with long, erect brown and white setae, anterior edge of forewing covered with dark brown setae, remainder of wing covered with golden setae and patches of white setae. Genitalia as in Fig. 3. Sternum IX, in lateral view with ventral margin straight, posterior margin slightly sinuate, anterior margin slightly produced submedially; in ventral view, nearly rectangular with rounded anterolateral margins. Tergum X membranous and bearing microsetae on dorsum, in lat-

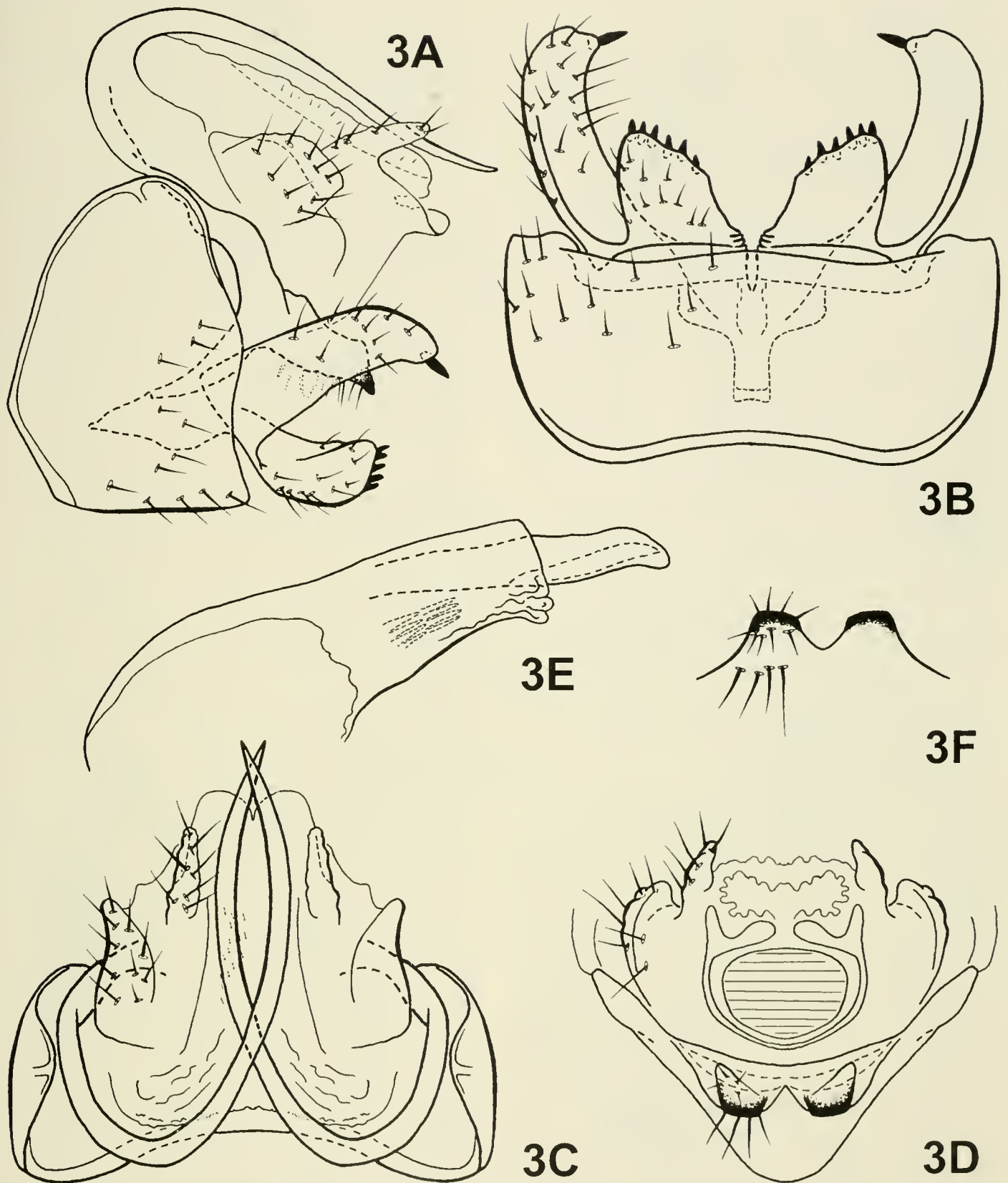


Fig. 3. *Polyplectropus hymenochilus*, male genitalia. A, Lateral view. B, Ventral view. C, Dorsal view. D, Caudal view of preanal and intermediate appendages. E, Phallus. F, Ventromesal process of the preanal appendage, dorsal view.

eral view elongate, in dorsal view with bilobed apex. Intermediate appendage digitate, setose, expanding posteroventrally into a membranous lip surrounding the phallus. Preanal appendage tripartite; dorsolateral process heavily sclerotized, elongate, orig-

inating from dorsum of mesolateral process, directed anteromesally, recurved posterolaterally, tapering mesally to acute apex; mesolateral process setose, thinly sclerotized, in dorsal view digitate, directed posterolaterally, in lateral view subquadrate, broad,

produced into setose ventromesal process; ventromesal process directed posteroven- trally, with highly sclerotized apex, pointed in lateral view, truncate in caudal view. In- ferior appendage divided into two lobes; dorsolateral lobe setose, in lateral view rod- like, base slightly broader than remainder two thirds, apex narrower and directed ven- trally, bearing single highly sclerotized apical spine, apex directed posteromesally; ventromesal lobe short, setose, half the size of dorsolateral lobe, in lateral view rectan- gular, basally narrow, posterior margin trun- cate and bearing six highly sclerotized spines (some specimens may have less); ventromesal lobe, in ventral view, quadrate, posterior margin transverse with many vis- ible spines, mesal margin broadening ba- sally and becoming pleated at base. Phallus short, ventrally membranous; phallic scler- ite cylindrical, narrowing to rounded apex, curved ventrally; endothecal membrane with approximately 20 small embedded phallic spines.

Female.—Unknown.

Type material.—Holotype: ♂. COSTA RICA: Guanacaste: Parque Nacional Guanacaste, El Hacha, Quebrada Alcornoque, 11.009°N, 85.577°W, el. 250 m, 26.vii. 1987, Holzenthal, Morse, Clausen (UMSP) (UMSP000060976). Paratypes: Same data as holotype, 1 ♂ (INBIO), 1 ♂ (NMNH); Guanacaste: Parque Nacional Guanacaste, El Hacha, Quebrada Pedregal, 10.983°N, 85.539°W, el. 300 m, 27.vii.1987, Holzen- thal, Morse, Clausen, 1 ♂ (UMSP).

Etymology.—*Hymenochilus* comes from the Greek words for membrane “hymeno” and lip or rim “-chilus,” which describes the weak membranous posteroventral ex- tension of the intermediate appendage, which surrounds the phallus.

***Polyplectropus kylistos* Chamorro-L. and Holzenthal, new species**

(Fig. 4)

Polyplectropus kylistos is closest to *Po- lyplectropus charlesi* (Ross) 1941 of the

charlesi group based on similarities in the elongate posteromesal expansion of ster- num IX, the overall shape of the ventro- mesal lobe of the inferior appendage, and the presence of a pair of posterolaterally di- rected spines embedded in the endothecal membrane of the phallus. *Polyplectropus kylistos* can be distinguished from *P. charlesi* by the semicircular shape and pointed apices of both lobes of the inferior appendage, and by the presence of a membranous projection bearing a single, robust, sclero- tized spine between the lobes of the inferior appendage.

Male.—Length of forewing 4.6 mm. Col- or in alcohol of body, legs and antenna yel- lowish brown; dorsum of head, pronotum, and tegula with long, erect brown setae. Genitalia as in Fig. 4. Sternum IX with ven- tral margin nearly straight, produced pos- teromesally, length of expansion almost half length of inferior appendage; anterior margin in lateral view rounded, posterior margin sinuate, anterior margin in ventral view concave. Tergum X membranous, trapezoidal with dorsal microsetae. Inter- mediate appendage with digitate, setose posterodorsal lobe expanded mesally and ventrally into membrane; posteromedial lobe with apical setae. Preanal appendage bipartite; mesolateral process setose, in dor- sal view digitate, in lateral view nearly cir- cular, produced ventrally into hooked ven- tromesal process; ventromesal process se- tose, in lateral view with apex rounded and produced into ventral point, ventral margin straight, in caudal view with apex concave, with lateral and mesal sclerotized points. Inferior appendage divided into two lobes; dorsolateral lobes setose, in lateral view semicircular tapering apically into poster- oventrally directed spine, in ventral view produced basolaterally, tapering mesally into apical spine; ventromesal lobe broad, ventral margin rounded, produced into pos- teromesally directed point, basodorsal mar- gin membranous, bearing a membranous lobe with a robust sclerotized apical spine; mesoventral lobe variable, apex truncate,

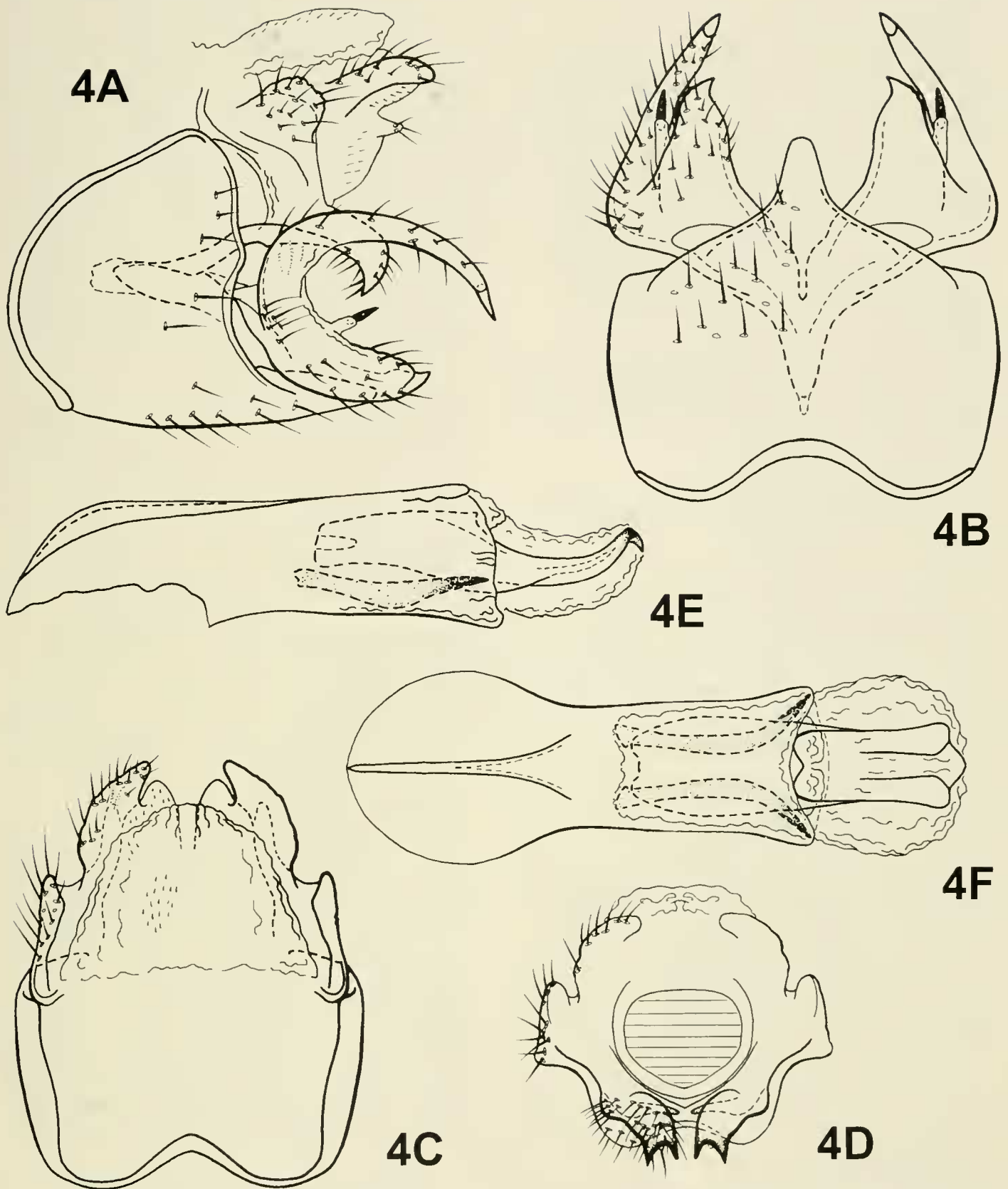


Fig. 4. *Polyplectropus kylistos*, male genitalia. A, Lateral view. B, Ventral view. C, Dorsal view. D, Caudal view of preanal and intermediate appendages. E, Phallus, lateral view. F, Phallus, dorsal view.

sometime bearing a spine on posterodorsal corner, in ventral view triangular, basally broad, with posteromesally directed, pointed apex. Phallus long; phallic sclerite in lateral view cylindrical, narrowing apically and bent dorsally, apex with ventrally di-

rected, highly sclerotized point; phallic sclerite in dorsal view rectangular, apex with posteromedial projection; endothelial membrane with pair of elongate, sclerotized, posterolaterally directed spines originating at base.

Female.—Unknown.

Type material.—Holotype, ♂. COSTA RICA: Guanacaste: Parque Nacional Guanacaste, Estación Pitilla, Río Orosí, 10.991°N, 85.428°W, el. 700 m, 22–25.v.1990, Holzenthal, Blahnik (UMSP) (UMSP000067800). Paratypes: Alajuela: Río Pizote, ca. 5 km (air), S. Brasilia, 10.972°N, 85.345°W, el. 390 m, 12.iii.1986, Holzenthal & Fash, 1 ♂ (UMSP), 1 ♂ (NMNH).

Etymology.—*Kylistos* comes from the Greek word for rolled or turned, which describes the semicircular shape of the inferior appendages.

***Polyplectropus paradelpheae* Chamorro-L. and Holzenthal, new species**

(Fig. 5)

Polyplectropus paradelpheae is very similar to *Polyplectropus yolandae* n.sp. in the digitate ventromesal lobe and basally narrow and apically broad dorsolateral lobe of the inferior appendage, in the mesoventrally directed digitate dorsolateral process of the intermediate appendage, and in the general form of the tripartite preanal appendage. *Polyplectropus paradelpheae* can be distinguished from *P. yolandae* by the broader ventromesal processes of the preanal appendages, which do not meet mesally. Instead, the mesal margins form an arc. It is also distinguished by the absence of a median lobe on the intermediate appendage, by the sinuate dorsolateral process of the preanal appendages, by the more elongate dorsolateral lobe of the inferior appendage, and by the wider phallus, which has an apically narrow phallic sclerite.

Male.—Length of forewing 5.0 mm. Color in alcohol of body yellowish brown. Genitalia as in Fig. 5. Sternum IX, in lateral view deltoid, ventral margin nearly straight, posterior margin sinuate. Tergum X membranous with microsetae on dorsum, in dorsal view trapezoidal. Intermediate appendage digitate, setose, directed mesoventrally. Preanal appendage tripartite; dorsolateral process heavily sclerotized, elongate, sinu-

ate, directed anteromesally, recurved posterolaterally, curving ventrally, finally straightening posteriorly and tapering into acute apex; mesolateral process setose, in dorsal view digitate, directed posteromesally, in lateral view nearly triangular, broad basally, produced into setose ventromesal process; ventromesal process, in lateral view broad, ending in pointed anteroventrally directed apex, in caudal view digitate, directed ventrally, mesal margin forming an arc. Inferior appendage divided into two lobes; dorsolateral lobe setose, elongate, narrow basally, broadening apically, posterior margin rounded, in ventral view with anterodorsal margin bent mesally, exposing internal margin, medial setose lobe originating from interior mesal margin; ventromesal lobe setose, narrow, digitate, less than one third size of dorsolateral lobe, with robust, sclerotized spines present on basomesal margin; base of inferior appendage elongate, narrow, produced anteriorly. Phallus membranous, stout; phallic sclerite curved ventrally, narrowing apically, membrane present dorsally.

Female.—Unknown.

Type material.—Holotype: ♂. COSTA RICA: Limón: Reserva Biológica Hitoy-Cerere, Río Cerere, 9.671°N, 83.028°W, el. 90 m, 23–24.iii.1987, Holzenthal, Hamilton, Heyn, 1 ♂ (UMSP).

Etymology.—*Paradelpheae* comes from the Greek words for beside “para-” and sister “-adelphe.” This species was concealed among the specimens of *Polyplectropus yolandae*, until it was discovered by the senior author after closer examination.

***Polyplectropus perpendicularis* Chamorro-L. and Holzenthal, new species**

(Fig. 6)

Polyplectropus perpendicularis belongs to the *charlesi* group with similarities to *Polyplectropus mignonae* Bueno-Soria 1990, especially the long and digitate intermediate appendage, the absence of dorsolateral process, the overall shape and round-

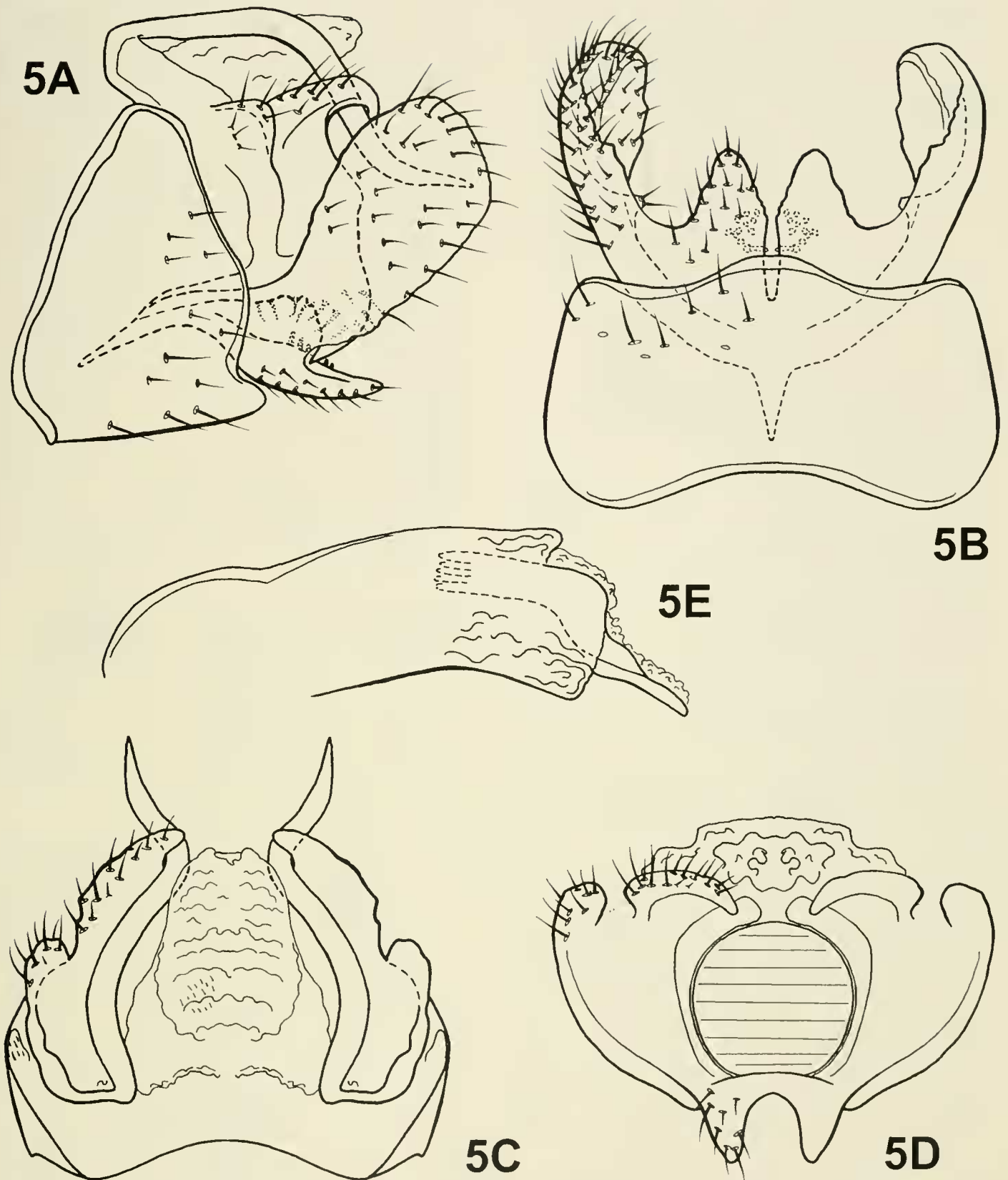


Fig. 5. *Polyplectropus parodelphae*, male genitalia. A, Lateral view. B, Ventral view. C, Dorsal view. D, Caudal view preanal and intermediate appendages. E, Phallus.

ed mesolateral process of the ventromesal process of the preanal appendage, and the elliptical ventromesal lobe of the inferior appendage, which bears many robust, sclerotized spines on its apex. *Polyplectropus perpendicularis* can be distinguished from

P. mignoniae by the shape of the dorsolateral lobe of the inferior appendage, which is narrow, dorsoventrally elongate, perpendicularly produced posterad, and has a truncate apex.

Male.—Length of forewing 5.8 mm. Col-

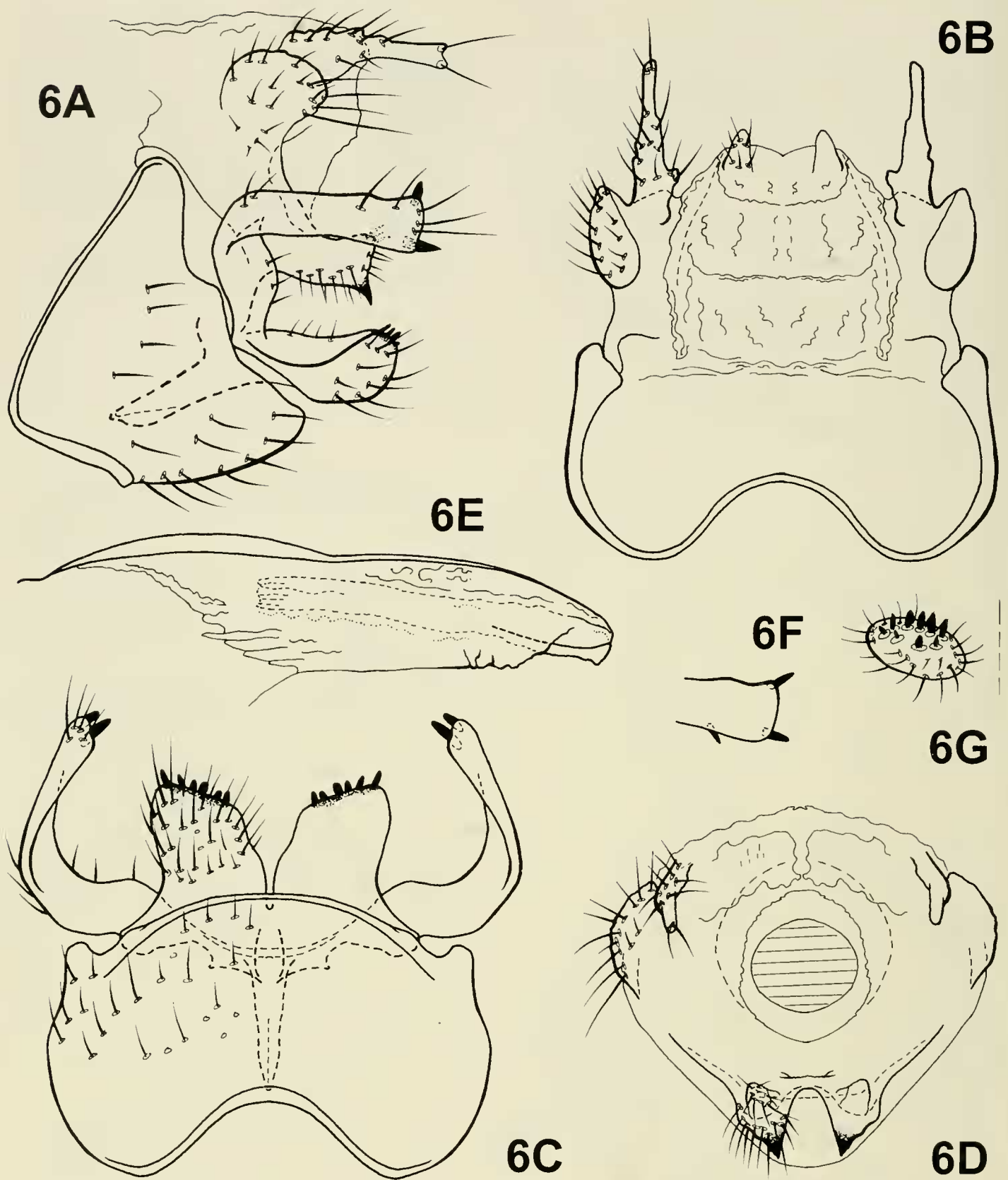


Fig. 6. *Polyplectropus perpendicularis*, male genitalia. A, Lateral view. B, Dorsal view. C, Ventral view. D, Caudal view of preanal and intermediate appendages. E, Phallus. F, Apex of left dorsolateral lobe of inferior appendage, lateral view. G, Ventromesal lobe with robust setae of inferior appendage, caudal view.

or of body dark brown, legs and antenna yellowish brown; dorsum of head, pronotum, tegula, and forewing base with long, erect brown setae and a few white setae; forewing with golden-brown setae, and lon-

gitudinal w-shaped patch devoid of setae in the region of the anal veins. Genitalia as in Fig. 6. Sternum IX, in lateral view, deltoid, posterior margin sinuate, anterior margin produced submedially, ventral margin near-

ly straight; sternum in ventral view ovoid, lateral margin rounded, anterior margin concave, posterolateral corners produced posterad, posterior margin semicircular. Tergum X membranous, short, in dorsal view subquadrate. Intermediate appendage digitate, elongate, broad basally, narrow medially, truncate apex each bearing two setae, as long as or longer than inferior appendage. Preanal appendage bipartite; mesolateral process setose, in lateral view circular, slightly expanded posterad, in dorsal view nearly oval, slightly expanded laterally, produced ventrally into ventromesal process; ventromesal process setose, in lateral view rectangular, with posterior margin truncate, expanded ventrally into sclerotized point, ventral margin nearly straight; ventromesal process, in caudal view triangular, with dorsal setose lobes, lateral and mesal margins nearly straight, meeting posteriorly in a sclerotized point. Inferior appendage divided into two lobes; dorsolateral lobe setose, in lateral view elongate dorsoventrally, perpendicularly bent posteriorly, width continuous throughout length, apex truncate and bearing two robust, sclerotized spines, originating on corner, sometimes subapically; dorsolateral lobe in ventral view flattened, expanded laterally, mesal margin concave, subapically curved mesoventrally; ventromesal lobe setose, in lateral view elliptical, with elongate medial flange, apex rounded and bearing dorsal cluster of robust, sclerotized spines, in ventral view rectangular, lateral margin concave, posterior margin transverse, with robust, sclerotized spines, six visible in ventral view, nine in caudal view, mesal margin nearly straight, broadening basally. Phallus long, largely membranous, narrowing apically; phallic sclerite cylindrical, apex nearly truncate.

Female.—Unknown.

Type material.—Holotype, ♂. COSTA RICA: Puntarenas: Tributary to Río Bellavista in Las Alturas (road to quarry) 8.952°N, 82.848°W, el. 1480 m, 19.iii.

1991, Holzenthal, Muñoz, Huisman (UMSP) (UMSP000060984).

Etymology.—*Perpendicularis* comes from the Latin word for upright or at right angles, which describes the dorsolateral lobe of the inferior appendage, which is narrow, dorsoventrally elongate and perpendicularly produced.

***Polyplectropus yolandae* Chamorro-L.
and Holzenthal, new species**

(Fig. 7)

Polyplectropus yolandae belongs to the *thilus* group based on similarities with *Polyplectropus carolae* Bueno-Soria 1990 and *Polyplectropus denticulus* Bueno-Soria 1990, especially the broad dorsal lobe and reduced, narrow ventromesal lobe of the inferior appendage. These species are also similar in the presence of the highly sclerotized, recurved dorsolateral process of the preanal appendage and in the overall shape of the preanal appendage and phallus. *Polyplectropus yolandae* can be distinguished from *P. carolae* and *P. denticulus*, and other members of the *thilus* group by the mesoventrally directed, digitate lobe of the intermediate appendage, by the more prolonged and rounded posterior margin of the dorsolateral lobe of the inferior appendage, and by the row of robust, sclerotized spines along the dorsal margin of the ventromesal lobe of the inferior appendage.

Male.—Length of forewing 4.8–5.0 mm. Color of body and antenna yellowish brown, legs with brown setae; dorsum of head, pronotum, anterior half of mesothorax, and tegula with long, erect brown, white, and golden setae; forewing with patches of brown, white, and golden setae, anterior edge bearing only brown setae. Genitalia as in Fig. 7. Sternum IX, in lateral view deltoid, produced anteroventrally, posterior and ventral margins straight; in ventral view nearly rectangular, posterior margin nearly straight, narrowing laterally, anteroventral corners rounded. Tergum X membranous, broad and elongate with microsetae on dorsum. Intermediate append-

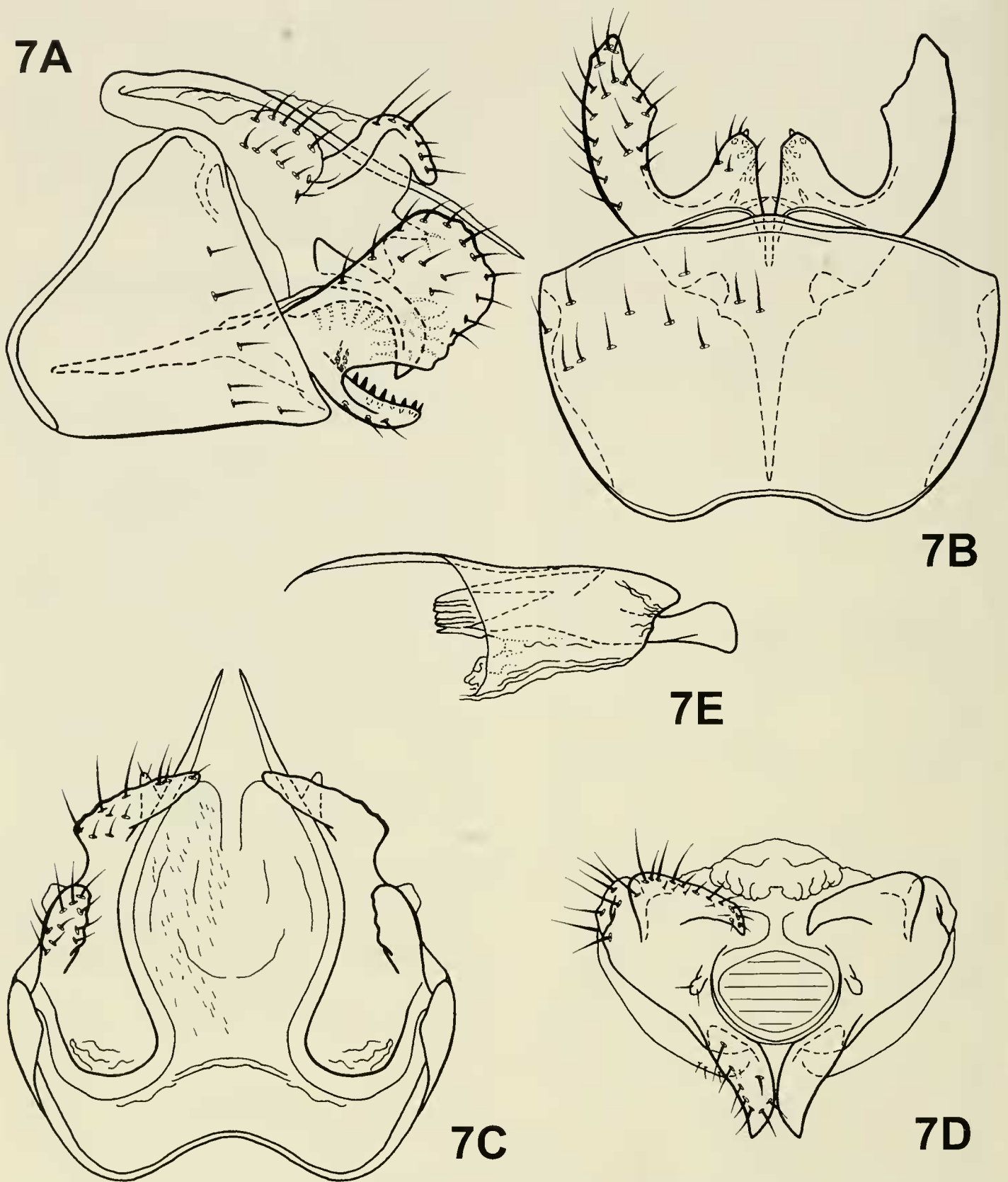


Fig. 7. *Polypsectropus yolandae*, male genitalia. A, Lateral view. B, Ventral view. C, Dorsal view. D, Caudal view of preanal and intermediate appendages. E, Phallus.

age bipartite; dorsolateral process digitate, setose, directed mesoventrally, produced into a small median lobe flanking the phallus laterally and bearing apical setae. Preanal appendage tripartite; dorsolateral process heavily sclerotized, elongate, orig-

inating from dorsum of mesolateral process, directed anteromesally, recurved posterolaterally, tapering mesally to acute apex; mesolateral process setose, in dorsal view digitate, directed posteromesally, in lateral view oval, broad basally, produced into se-

tose ventromesal process; ventromesal process, in lateral view, broad basally, tightly bent ventrally, narrowing medially, slightly broadening subapically, finally tapering to pointed apex; ventromesal process, in caudal view digitate, directed mesally, apex weakly recurved laterally. Inferior appendage divided into two lobes; dorsolateral lobe setose, basally narrow broadening apically, posterior margin rounded and slightly produced (in some specimens margin evenly rounded); ventromesal lobe setose, narrow, digitate, less than half length of dorsolateral lobe with robust, highly sclerotized spines present on entire length of dorsal margin; base of inferior appendage elongate, narrow, produced anteriorly. Phallus short, weakly sclerotized; phallic sclerite robust, cylindrical, narrow subapically, broadening apically, apex truncate.

Female.—Unknown.

Type material.—Holotype: ♂. COSTA RICA: Guanacaste: Parque Nacional Guanacaste, Estación Maritza, Río Tempisque, 10.958°N, 85.497°W, el. 550 m, 30–31.viii.1990, Huisman, Blahnik, Quesada (UMSP) (UMSP000060980). Paratypes: Same data as holotype, 8 ♂ (UMSP); same data as holotype, 19–20.vii.1987, el. 1,550 m, Holzenthal, Morse, Clausen, 2 ♂ (NMNH); Guanacaste: P.N. Guanacaste, Estación Pitilla, Río Orosí, 10.991°N, 85.428°W, el. 700 m, 22–25.v.1990, Holzenthal & Blahnik, 1 ♂ (UMSP); Guanacaste: P.N. Guanacaste, Maritza, Río Tempisque Sur, 10.95°N, 85.48°W, el. 600 m, 30.viii.1990, Huisman & Quesada, 3 ♂ (INBIO); Guanacaste: P.N. Guanacaste, ca. 0.7 km N. Estación Maritza, 10.96°N, 85.50°W, el. 550 m, 30.viii.1990, Huisman & Quesada, 1 ♂ (UMSP); Alajuela: Reserva Forestal San Ramón, Río San Lorencito and tributaries, 10.216°N, 84.606°W, el. 980 m, 6–10.iii.1991, Holzenthal, Muñoz, Huisman, 2 ♂ (UMSP); Alajuela: P.N. Rincón de la Vieja, Quebrada Provisión, 10.769°N, 85.281°W, el. 810 m, 4.iii.1986, Holzenthal & Fath, 1 ♂ (UMSP); Heredia: Rara Avis Biological Station, Quebrada Chiquiza,

10.229°N, 84.032°W, 31.iii.1989, el. 550 m, Blahnik & Solis, 1 ♂ (UMSP).

Etymology.—Named in honor of Jolanda Huisman for her contributions to the study of Trichoptera and for her collaboration in the Costa Rican inventory.

ACKNOWLEDGMENTS

We thank Dr. Oliver S. Flint, Jr., Smithsonian Institution, for providing specimens and for advice regarding the manuscript. Thanks are also extended to Dr. Roger Blahnik for his advice and assistance. This material is based upon work supported by National Science Foundation Grants BSR-8512368, BSR-8917684, and DEB-9400632 (for field work in Costa Rica) and DEB-9977939 (a PEET grant to study Neotropical Trichoptera taxonomy). The manuscript was completed while the senior author held a research fellowship from the Smithsonian Institution. This support is gratefully acknowledged.

LITERATURE CITED

- Banks, N. 1913. Synopses and descriptions of exotic Neuroptera. *Transactions of the American Entomological Society* 39: 201–242.
- Bueno-Soria, J. 1990. Estudios en Insectos Acuáticos VIII. Revisión para México y Centro América del Género *Polypectropus* Ulmer (Trichoptera: Polycentropodidae). *Anales del Instituto de Biología, Universidad Nacional Autónoma De México, Series Zoológica* 61(3): 357–404.
- Denning, D. G. 1962. New Trichoptera from México. *Journal of the Kansas Entomological Society* 35(4): 402–408.
- Flint, O. S. 1967. Studies of Neotropical caddisflies. V: Types of species described by Banks and Hagen. *Proceedings of the United States National Museum* 123 (3619): 1–37.
- . 1968. Bredin-Archbold-Smithsonian Biological Survey of Dominica, 9. The Trichoptera (Caddisflies) of the Lesser Antilles. *Proceedings of the United States National Museum* 125(3665): 1–86.
- Flint, O. S. Jr., R. W. Holzenthal, and S. C. Harris. 1999. Catalog of the Neotropical caddisflies (Insecta: Trichoptera). Special Publication. Ohio Biological Survey, Columbus, Ohio, 239 pp.
- Hamilton, S. W. 1986. Systematics and biogeography of the New World *Polycentropus sensu stricto* (Trichoptera: Polycentropodidae). Ph.D. Dissertation, Clemson University, Clemson, 257 pp.

- Morse, J. C., Clemson University. 2001. Trichoptera World Checklist. <http://entweb.clemson.edu/database/trichopt/index.htm>
- Ross, H. H. 1941. Descriptions and records of North American Trichoptera. *Transactions of the American Entomological Society* 67: 35–126.
- . 1947. Descriptions and records of North American Trichoptera, with synoptic notes. *Transactions of the American Entomological Society* 73: 125–168.
- Ulmer, G. 1905. Zur Kenntniss Aussereuropaischer Trichopteren. *Stettiner Entomologische Zeitung* 66: 3–119.
- . 1911. Einige Südamerikanische Trichopteren. *Annals de la Société Entomologique du Belgique* 55: 15–26.
- . 1962. Ein neuer name für *Ecnomodes* Ulm. (Trichoptera). *Mitteilungen der Deutschen Entomologisch Gessellschaft* 21: 5.
- Yamamoto, T. 1966. Five new species of the Caddisfly genus *Polycentropus* from South America (Trichoptera: Polycentropodidae). *Canadian Entomologist* 98: 908–912.
- . 1967. New species of the Caddisfly genus *Polycentropus* from Central America (Trichoptera: Polycentropodidae). *Journal of the Kansas Entomological Society* 40: 127–132.